



Noise in the Intensive Care Unit: fiction or fact ?

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Introduction:

Noise exposure in the intensive care unit can have a negative impact on patients' well-being as well as on optimal functioning of both nursing and medical staff.

The WHO recommends average sound levels for hospital wards below 35 dBA with a maximum of 40 dBA at night time (1).

Reported sound levels in Intensive Care Units are significantly higher with average sound levels always exceeding 45 dBA and for 50% of the time exceeding 52 dBA (2).

After several patient complaints and remarks from the nursing staff as well as the medical staff about noise, we wanted to assess a potential noise problem by measuring sound levels in one ward (12 beds) of our ICU.

Methods:

A sound level meter (Amptec 10EaZy RT) was placed bedside in a two-bed room as well as at the nursing station. Measurements were performed after a two week adjustment period to avoid a Hawthorne effect. Sound levels were continuously recorded for 24 hrs at each location.

Results:

Bedside, average sound levels were 52.8 dBA during the night and 54.6 dBA during the day. Fourteen sound peaks above 80 dBA were recorded with the highest peak at 101.1 dBA.

At the nursing station, average sound levels of 52.6 dBA at night time and 53.9 dBA at day time were recorded. Here, we noticed 11 peaks above 80 dBA with a maximum sound peak of 90.6 dBA.

Those measurements are significantly above the WHO recommendations of 35 dBA_{LAeq} and 40 dBA_{LAm_{ax}}, but comparable with other ICU recordings

	Bedside		Nursing station	
	Before	After	Before	After
Average sound level: night	52.8 dBA	52.9 dBA	52.6 dBA	52.2 dBA
Average sound level: day	54.6 dBA	53.7 dBA	53.9 dBA	53.2 dBA
Average sound level/24 hrs	53.7 dBA	53.3 dBA	53.3 dBA	52.7 dBA
Incidence sound level peak > 80 dBA	14	16	11	10
Maximum sound level peak / 24 hrs	101.1 dBA	91.6 dBA	90.6 dBA	86.9 dBA

Conclusion:

The sound levels in our ICU clearly exceeded the WHO recommendations but are comparable with sound levels in other ICU's (1-2).

Those elevated sound levels as well as frequent sound level peaks can be responsible for the subjective feeling of noise pollution experienced by patients, nurses and doctors.

In our department, measures should be taken to reduce the average sound level on one hand and the incidence and altitude of sound level peaks on the other hand.

References:

1. Berglund B, Lindvall T, Schwela DH: Guidelines for Community Noise Geneva: World Health Organization; 1999 [<http://whqlibdoc.who.int/hq/1999/a68672.pdf>].
2. Darbyshire and Young Critical Care 2013, 17:R187